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Group Tester One (GT1)

Group Tester One

Model: All

Production: All

OBJECTIVES

After completion of this module you will be able to:

- Identify the components of the GT1.

- Demonstrate how to properly connect the diagnostic head via hardwire.

Group Tester One (GT1)

The Group Tester One (GT1) is a portable diagnostic tools. It has the same processor as the DISplus; a Pentium III, with 256 MB RAM and a 20 GB harddrive.

Other features include:

- 12.1" TFT color display, 1024 x 768 resolution
- Integrated PCMCIA card reader
- Integrated chip card reader
- Touch screen - same as DISplus
- Workshop grade case
- ASM-technology motherboard
- Temperature operating range from 35°F to 105°F
- 2.5 hours of operation with a fully charged battery.
- Can be powered by vehicle battery.
- Weighs 7.7 lbs.

Components of the GT1

1. Control Panel
2. Docking Station
3. Bench Power Unit (not used)
4. Optical Keyboard
5. LAN Control Panel Cable (Crossed)
6. LAN Control Panel Adapter (Uncrossed)
7. LAN Control Panel Cable (same design as 10)
8. Multifunction Cable MFK 1
9. Multifunction Cable MFK 2
10. LAN Docking Station Cable (same design as 7)
11. Touch Pen
12. Diagnostic Cable - OBD
13. Diagnostic Head
14. LAN Diagnostic Head Cable
15. Diagnostic Cable - 20 pin (not used)
16. Vehicle Battery Adapter Cable
17. Size 2 Adapter (for 50 A clamp)
18. Ammeter Clamp 50 A

Control Panel

The control panel is the central component of the GT1. The operating system and the application programs are stored here.

Located on the front of the Control Panel:

- PCMCIA interface (radio card slot in left handle)

- Monitor with touch capabilities

- Control Block

- Battery Compartment (in right handle)

Monitor

The surface of the monitor is covered by a touch-sensitive plastic sheet that senses the pressure of a finger or the touch pen and transfers it to the system.

Note: Use only your finger or the touch pen supplied to operate the touch screen. If other objects are used, it may damage the GT1 Screen.

Control Block

The main control block of the GT1 control panel is located under the center of the touch-screen. It consists of 1 on/off switch, 3 LEDs and the infrared receiver port. The infrared port is the connection to the wireless keyboard used during programming.

The On/Off switch is used to switch the control panel on and off or to initiate a forced switch-off. If a fault occurs that causes the unit to "lock-up", you can shut down the unit by holding down the on/off button for 5 seconds. This may cause the loss of operating software, necessitating a reinstall (use only in an emergency).

The status of the switch does not affect the charging operation.

1. IR Interface
2. Temperature LED
3. Battery LED
4. Operation LED
5. ON/OFF Switch

The "temperature" LED will glow red when the control panel is overheated. The control panel will shut down approximately 10 seconds later. See the Owner's Manual for restart procedures.

The "battery" LED will glow yellow during charging. It will switch off to signify the battery is fully charged. It will flash yellow if excessive temperatures continue.

The "operation" LED will glow green when using an external power source, glow orange when using the internal battery. A flashing orange LED signifies a discharged battery.

Alternately flashing orange/green LED denotes that the internal battery is defective or has been removed.

Control Panel Connections

TOP

Bottom
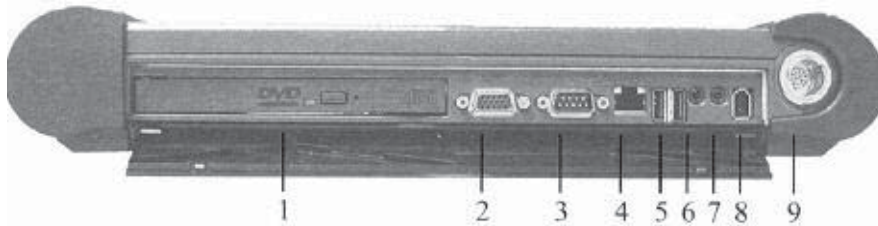
1. DVD drive - DVD and CD-ROM compatible
2. VGA - external monitor connection
3. COM - future application
4. LAN - network or diagnostic head connection
5. USB (2) - future applications (approved PostScript printer)
6. Audio in - microphone
7. Audio out - speakers or headphones
8. Firewire - multimedia functions, future applications
9. Base Measurement - MFK 1 and MFK 2 or
   External power supply from vehicle electrical system
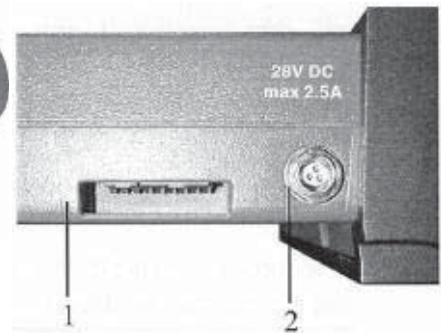
1. Docking station interface
2. Bench power supply connection. An optional power supply when not using the docking station (not for MINI)

Power Supply

The control panel is supplied power from one of three voltage sources:

- Internally from the battery (approximately 2.5 hours of operating time).
- Externally from the bench power unit or the docking station.
- Externally from the vehicle electrical system.

DVD Drive

The DVD Drive is accessible from the top of the control panel. It accommodates DVD's and CD-ROM's for installing programs, applications or updates of the control panel.

Note: When you open and close the DVD drive the control panel must be in the 14° inclination position as shown, otherwise the drive tray or the disc may be damaged. The suspension system for the drive is optimized for 14°. Do not use the DVD unless the control panel is attached to the docking station.

Docking Station

The Docking Station is intended for stationary operation, it replaces the bench power unit and provides the power supply. The Docking Station also provides the interfaces for connection to a USB device and the LAN Network.
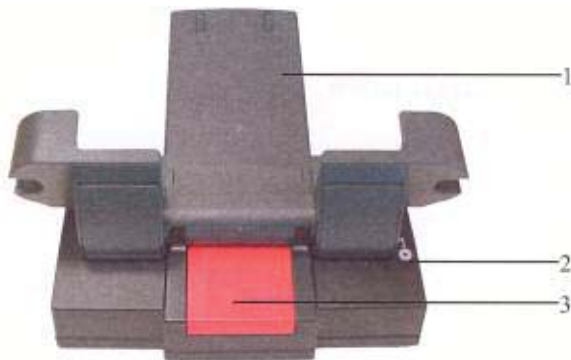
1. Docking interface for the Control Panel
2. Hinge - used to change viewing angle
3. Hinge Release
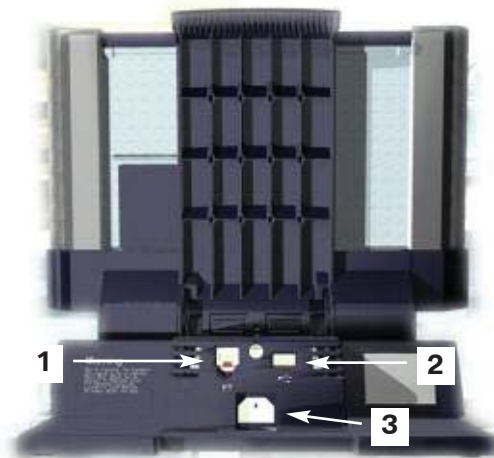
1. LAN connection
2. USB port
3. Power cord

Bench Power Unit

As an alternative to the docking station, the bench power unit may be used to power the control panel. The bench power unit consists of the built in connecting cable on the control panel, the power unit itself and a separate power cable. When the control panel receives power from the bench power unit, the internal battery is simultaneously charged.

Optical Keyboard

The keyboard uses an Infrared link to communicate with the GT1 control panel. It is used only for service programs and can not be used in place of the virtual keyboard of the control panel. The keyboard must always face the control panel when in use and must be less than 1 meter away from the control panel (IR). The keyboard uses 4 AA batteries as an internal power supply.
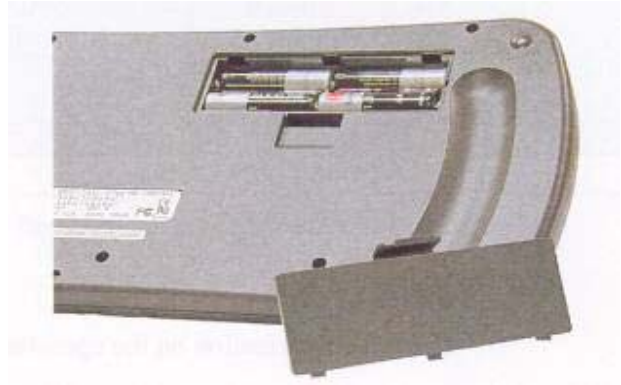
CAUTION!!! **Old batteries can leak and damage the keyboard. Always keep fresh batteries in the keyboard (or remove when not in use).**

If more than one GT1 is in use in the workshop, the optical keyboard should be configured to a specific GT1 control panel as follows:

1. Press and hold the identification key while pointing the keyboard at the control panel.

2. Press a numeric key, 0-7 on the keyboard. The control panel will now respond only to commands from that keyboard.

If necessary the identification can be changed at any time following the above instructions.

1	IR interface
2	Identification key

LAN Control Panel Cable (Crossed)

The LAN control panel adapter (crossed) is approximately 30 cm long with a RJ45 connector and a RJ45 socket. It is identified by a black (yellow on early units) stripe near the socket and a label reading "LAN Adapter BT X." This crossed cable is needed to be able to communicate between the diagnostic head and the GT1.

LAN Cable Crossed

LAN Control Panel Adapter (Uncrossed)

The LAN control panel adapter (uncrossed) is approximately 30 cm long with a RJ45 socket and a RJ45 connector. It can be identified by a gray stripe near the socket and a label reading "LAN Adapter 1:1."

LAN Cable Uncrossed

LAN Control Panel Cable

The LAN diagnostic head cable is 10 meters long and has a RJ45 connector and an orange plug connector.

Lan Cable (orange color coded end)

MFK1 and MFK2

The MFK1 and MFK2 cables are the main leads used for measurements. They are similar in appearance, but have different measurement capabilities.

Only one cable, either MFK1 or MFK2 (visual markings) may be connected to the control panel at one time unless a Measurement Interface Box (MIB) is used.

Both Both large positive cable ends of MFK 1 and MFK 2 include a button used to hold the measured value on the display screen.

Multi-Function Test Cable-MFK #1
MFK 1 is used to measure:

- Voltage - up to 50 Volts
- Current - up to 2 Amps
- Resistance
- Diode Testing
- Frequency
- Period
- Duty Cycle
- Pulse Duration
- Oscilloscope Measurements

MFK1

Multi-Function Test Cable-MFK #2
MFK 2 is used to measure:

- Voltage - up to 500 Volts
- Frequency
- Period
- Duty Cycle
- Pulse Duration
- Oscilloscope Measurements

MFK2

Touch Pen

The Touch Pen is an ergonomic operating aid for the touch screen that makes it easier to operate the displays.

OBD Diagnostic Cable

The Diagnostic Cable is used to connect the diagnostic head to a vehicle via the OBD II diagnostic connector (upper right).

Diagnostic Head

The Diagnostic Head enables operation of the diagnostic interface via either radio or cable communication.
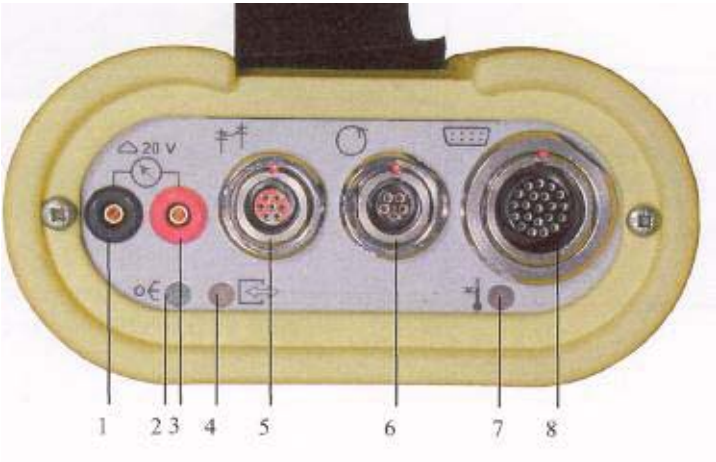
1. Connection for Voltage Measurements
2. LED 1 (Power)
3. Connection for Voltage Measurements
4. LED 2 (Status)
5. Connection for LAN Cable
6. Connection for TD Cable
7. LED 3 (Excess Temperature)
8. Connection for Diagnostic or OBD Cable

LED 1 Green	LED 2 Yellow	LED 3 Red	Function	Remarks
ON	ON	ON	Initialization	Recorder Button Green
ON	OFF	OFF	PowerUp	
ON	Flashing	OFF	Standby	
ON	ON	OFF	Connected	
Flashing	ON	OFF	Self Test or Update	
		Flashing	Excess Temperature	Fault
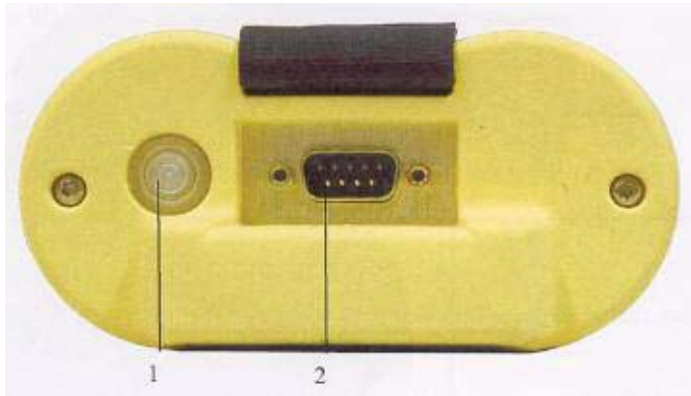
1. Recorder Button (For Future Use)
2. Nine Pin Interface (For Future Use)

Vehicle Battery Adapter Cable

The vehicle battery adapter cable is used while in the vehicle as a power supply for the GT1. This cable does not charge the GT1's internal battery.

Ammeter Clamp with Adapter

The ammeter clamp and adapter can be used to measure the amperage of a circuit inductively. There are two amperage clamp available: one measures up to 50 amps, the other up to 1000 amps.

Battery

Power is supplied by the integrated battery when the control panel is not connected to an external power source. The battery must be charged to insure uninterrupted use of the control panel as a mobile test unit. The battery is charged automatically as soon as the control panel is placed in the docking station or connected to the bench power supply. While the battery is being charged the "Battery" LED illuminates in yellow.

To achieve the longest possible service life for the integrated battery, it must be fully charged, then discharged for normal use. Once a month the battery should be "formed" which entails fully discharging the battery, then fully recharging it.

To "form" the battery:

- Disconnect the bench power unit from the control panel or undock from the docking station or disconnect the docking station from a power source.
- Fully discharge the battery, by leaving the control panel "ON" until all the LEDs are out.
- Dock the control panel or supply power to the docking station or connect the bench power unit.

Charging is complete when the "Battery" LED goes out.

Note: Always replace a defective battery with a new battery. Never operate the control panel with out a battery (it acts as a buffer). Sudden interruption of power my cause the control panel to loose the installed operating system.

Replacing the Battery

1. Switch off power and undock control panel.

2. Remove screw on right hand handle.

3. Pull off handle.

4. Remove battery.

5. Press down on the retainer for the connector and carefully remove connector.

6. Connect new battery.

7. Insert new battery in handle.

8. Reinstall handle on control panel.

9. Completely charge new battery.

Diagnosing with the GT1
(hardwired to the diagnostic head)

For hardwire connection three cables must be used:

- LAN control panel adapter UNCROSSED
- LAN control panel adapter CROSSED
- LAN Diagnostic head cable

The three cables MUST be connected in the particular order shown below.
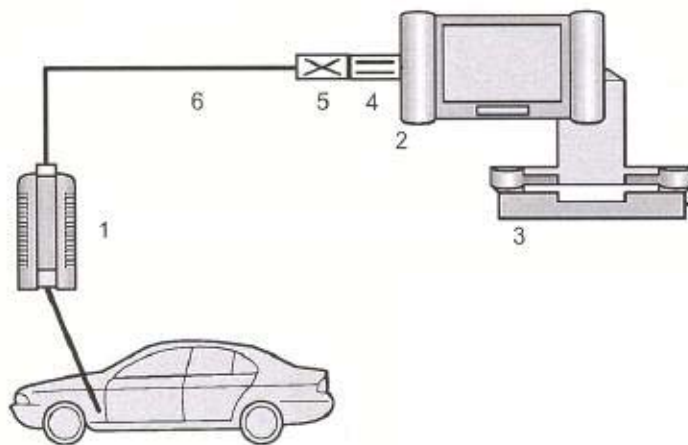
1. Diagnostic Head
2. Control Panel
3. Docking Station
4. LAN Control panel adapter UNCROSSED
5. LAN Control panel adapter CROSSED
6. LAN Diagnostic Head Cable

GT1 Troubleshooting

Control Panel

Symptom	Possible Causes	Remedy
The system "crashes"; the hourglass no longer changes back to the cursor arrow; no operation possible	Internal Fault	If 'normal' switch-off not possible, use a forced switch-off (press the on/off switch for approx. 5 seconds) to switch the control panel off and on again.
With the control panel docked, the "Operation" LED lights up orange.	Docking station power supply is interrupted. Control Panel is not supplied with power via the docking contact.	Check whether power is present. Insert the power plug correctly. Check the spring contacts for dirt or foreign objects. To setup a correct connection, undock and then redock the control panel two or three times (also see Section 7.3). If no faults can be determined, send a Fault Report Fax.
"Temperature" LED lights up red; control panel switches off.	Excess internal temperature circuit breaker activated.	Move the control panel to a cooler room and allow it to cool down adequately. Switch the control panel on again. If the "Temperature" LED flashes yellow without the presence of high ambient temperature, send a Fault Report Fax.
"Battery" LED flashes yellow for 10 seconds on startup; control panel does not start.	After the control panel shuts itself off, there is still excess temperature.	Move the control panel to a cooler room and allow it to cool down adequately. Switch the control panel on again. If the "battery" LED flashes yellow without the presence of high ambient temperature, send a Fault Report Fax.
System does not power up completely; gets 'stuck' with an error message.	Internal run error	Switch the control panel off (press the on/off switch for 5 seconds = forced switch off) and then on again. If the system still freezes, you must reinstall the Base CD in accordance with Section 3.5.3. If this fault occurs repeatedly, send a Fault Report Fax.
After complete discharge and docking at the docking station, the system does not power up.	Profound discharge of the battery.	After a profound discharge and docking at the docking station, you must wait approx. 3 minutes before the system can be powered up

Note: The power supply to the control panel cannot be measured at the open docking contact because the power is through-connected via a proximity switch only when the control panel is docked.

CAUTION!!! **Forced Switch-Off may be used only in the case of special faults. Continued use of this feature may cause operating system failure and device shut down. Normal shut off is performed by pressing the ON/OFF switch for 2 seconds.**

Touch Screen

Symptom	Possible Causes	Remedy
The cursor does not respond (does not follow finger contact).	Touch controller defective or system 'crashed'.	Switch the control panel off (press the on/off switch for 5 seconds = forced switch-off) and then on again. If the fault persists or occurs more frequently, send a Fault Report Fax.
The touch screen remains dark; no error message by means on LED.	Touch screen is in the energy-saving mode. Backlighting failure.	Not a fault. The screen image reappears when the touch screen is touched. If you glance sideways at the touch screen, you can detect vague characters. Send a Fault Report Fax.
The cursor arrow is not located beneath the point of touch (touch offset)	Touch the controller set incorrectly.	The touch controller must be calibrated in the "Administration" window. Press the "Calibrating touch screen" button, enter the password and follow the instructions that are displayed. If this does not eliminate the problem, send a Fault Report Fax.
Incorrect pixel colors	Individual transistors defective.	Individual pixels of incorrect colors are tolerable. If the entire screen rows or columns are incorrect, send a Fault Report Fax.

Important: **Only use finger or the touch pen to operate the screen. Screen damage may result otherwise.**

Plug-in Connections

Symptom	Possible Causes	Remedy
50 A ammeter clip cannot be connected	Connectors on the ammeter clip do not fit in the socket.	Use the size 2 adapter
Cable connection via LAN interface to diagnostic head interrupted	Plug-in connections on LAN adapter defective	Check that the plug-in connections are correctly seated and undamaged. Check whether the plug-in connection via the LAN control panel adapter (uncrossed) has been established.

Important: **Never use force to insert the connectors. The connectors on the measuring and diagnostic cables are marked with a red dot that must be aligned with a corresponding dot on the socket.**

Printer

Symptom	Possible Causes	Remedy
Local Printer does not print	Printer connected to docking station, control panel undocked.	Dock the control panel or insert the USB cable on the printer in the control panel. Check that the connection is correctly seated.
	Printer is defective.	In the "Administration" window, press the "Self-test" button and select the "Printer connection" function from the menu displayed. The printer should print a page with the heading "PS". If this does not occur, check the cable connection to the printer.
Network Printer does not print.	Network printer connected via LAN cable to docking station; control panel undocked.	Dock the control panel.
	Radio link to diagnostic head established	Disconnect the cable connection to the diagnostic head and established a connection to the network printer in accordance with Section 4.4.8.
	Cable link to diagnostic head established.	Disconnect the cable connection to the diagnostic head and established a connection to the network printer in accordance with Section 4.4.8.
	Printer Defective.	In the "Administration" window, press the "self-test" button and select the "printer connection" function from the menu displayed. The printer should print a page with the heading "PS". If this does not occur, chack whether the correct IP address for the printer is entered in the "Administration – Network configuration" window.

Accessories

Symptom	Possible Causes	Remedy
No measurements possible with MFK1.	Measuring head defective.	In "Administration", run a self-test of the MFK1. If an error message is issued regarding the measurement system or measuring cable, send a Fault Report Fax.
No measurements possible with MFK2.	Measuring head defective.	In "Administration", run a self-test of the MFK2. If an error message is issued regarding the measurement system or measuring cable, send a Fault Report Fax.
No input possible via the optical keyboard.	No IR connection possible or batteries discharged.	Check whether the transmit and receive windows of the infrared connection are covered. Change the distance between the devices. Replace the batteries in the optical keyboard. If no connection can be setup, send a Fault Report Fax.

Docking Station

Symptom	Possible Causes	Remedy
No power supply to the control panel ("Operation" LED does not light up in green on docking when switched on).	No power supply or power supply plug disconnected.	Insert the power supply plug. Press the on/off switch.
	Docking contacts dirty	Carefully clean the contacts on the docking station with a lint-free cloth.
	Foreign object prevents the perfect seating of the plug-in contacts.	Remove the foreign object.
	Proximity switch is defective, does not through-connect power.	Send a Fault Report Fax
	Power supply unit defective	Send a Fault Report Fax
	LED defective	Send a Fault Report Fax
"Battery" LED does not light up orange when switch off.	Battery is fully charged.	Not a Fault.
	Docking contacts dirty.	Carefully clean the contacts on the docking station with a lint-free cloth.
	Power supply unit defective.	Send a Fault Fax
	LED defective.	Send a Fault Report Fax

Fault Codes

Codes	Fault Group
000	System error from UNIX operating system
100	Fault in the measurement system, internal
200	Fault in the EDIC application
300	Fault in the system technology
400	Fault in the TOROS application
500	Fault in the measurement system application
800	Run error
900	Internal error

Diagnostic Head

Symptom	Possible Causes	Remedy
No connection possible (LED 1 on diagnostic head is dark).	No Power supply of the diagnostic head via vehicle electrical systems.	First check the plug-in contact on the BMW or OBD diagnostic cable and its connection to the vehicle. Switch on the ignition. If the LED still does not light up, send a Fault Report Fax.
Connection to the diagnostic head not possible or faulty (LED 2 flashes yellow); no diagnostic head is recognized (see "Administration, Diagnostic Head Allocation" window). The diagnostic head cannot be connected.	Interference due to excessive distance from the vehicle; in the case of radio link, may also be due to external radio sources or absorption.	Check the correct connection of the cables at the diagnostic head. Change the location of the diagnostic head and, if necessary, of the control panel. If this does not remedy the fault, change the connection type. If there is still no connection, send a Fault Report Fax.
	Diagnostic head software defective.	Perform a reinstallation in accordance with Section 7.7
	Incorrect IP address when the diagnostic head was changed.	Check the IP address in the "Administration, Network configuration" window.
	Radio card in the diagnostic head defective.	If possible, use the second diagnostic head to check the radio link. If the connection can be established, the card in the first diagnostic head is defective. Send a Fault Report Fax.
	Radio card in the control panel is defective.	If possible, use the second diagnostic head to check the radio link. If no connection can be established with this head either, the card in the control panel might be defective. Using a suitable tool (such as a screwdriver), pry the cover off the radio card slot in the left handle of the control panel (see fig. 7.1); you will then see one green and one yellow LED on the radio board. If the green LED is lit, the radio board is OK. If the yellow LED is flashing rapidly, data transmission is being formed correctly. If the LEDs are in any other state, send a Fault Report Fax.
LED 3 Flashing Red	Interior temperature of the diagnostic head is too high.	Terminate the diagnosis. Terminate the connection and allow the diagnostic head to cool adequately before using it again.
LED 1 flashing rapidly	General fault in the diagnostic head.	Send a Fault Report Fax.
"Recorder" button on the back lights up in green.	Only while booting.	Not a Fault. This button has not function at this time.

Measurements Interface Box (MIB)

The MIB was developed to expand the basic measurement capabilities and functions of the GT1 to the level of the DISplus.

The MIB contains all of the components necessary for acquiring static and dynamic signals, generating stimulation signals as well as complex measurements. The MIB collects the signals directly from the vehicle, processes them and transfers them to the diagnosis system for analysis.

The MIB is connected to the GT1 via the new MIB-GT1 connection cable. The GT1 automatically recognizes if the MIB is connected when "Measuring System" is selected. When the Measuring System is selected the "Ready" light on the MIB will light.

The following items are included with the MIB when delivered:

- Measurement Interface Box
- 1000 amp clamp
- 25 bar pressure sensor – plastic cable protector is locked to the pressure sensor body. **Do not attempt to open it**.
- Quick connect adapter for 25 bar cable
- MIB-GT1 connecting cable
- KV clip
- RZV cable
- Temp sensor
- Clip-on trigger sensor
- Stimulation cables 1&2
- External power supply unit.
- TD cable

Front Panel

Push-pull connectors are used on the front for easy removal/installation during testing.

The following push-pull connectors are on the front for the following cables:

- MFK1- distributed with GT1
- MFK2- distributed with GT1
- 50 amp clamp (not included with MIB shipment)
- 1000 amp clamp
- 2 pressure sensors (DR1 & DR2) – only the 25 bar sensor included with MIB.
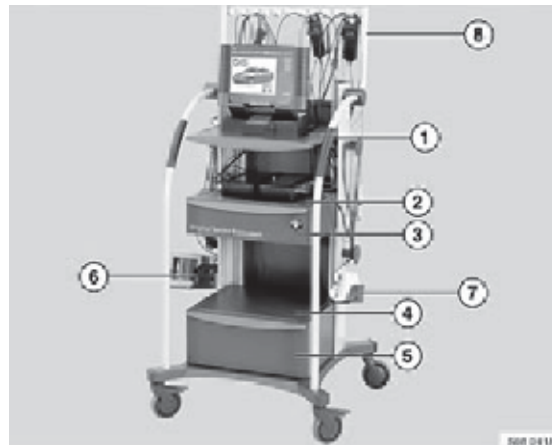- KV/RZV

Rear Panel

7 D-sub connectors are on the back for the following cables:

- MIB-GT1 main cable
- Temp sensor
- Clip-on trigger
- Stimulation cable1
- Stimulation cable 2
- TD cable

The cables on the back must be permanently connected to the MIB and not removed during operation. The MIB recognizes the cables attached.

GT1 Trolley

The GT1 Trolley was developed so that all of the GT1 peripheral pieces could be safely stored and close at hand for quick use. This includes the Measurement Interface Box (MIB) and associated cables. The GT1 trolley will remain viable for future workshop systems.

GT1 Setup with Trolley

Notes:

The GT1 Trolley stores the following peripherals for quick access:

1. GT1 storage shelf – the GT1 locks onto the shelf to protect it from falling.
2. MIB storage shelf – uses a Velcro strap for protection.
3. Storage drawer for keyboard.
4. Deutronic battery charger storage shelf.
5. Storage drawer for MFK and LAN cables.
6. Storage bracket for the OPPS/OPS head. (not used for MINI)
7. Storage bracket for the GT1 head.
8. Storage hooks for the MIB cables.

Utilization Notes:

- Never push the trolley by the top cable rack. Always push it by the grey curved handles.
- Take the time to run the cables neatly the first time. Time spent here will save you time during usage.
- The test cables are run up behind shelf (1) and hung from the test cable rack (8).
- Power cables for the GT1 and MIB are run down behind shelves 2 and 4. A power strip can be installed behind drawer 5 and the power cable run out through the opening in the back of the trolley.
- A Deutronic battery charger can be placed on shelf 4. The cables are stored in drawer 5 when not in use.
- Take care to properly replace all cables when finished. Proper cable storage saves everyone time and money.